

REMARKS

Claims 1-21 and 41-49 are pending in the application. The cancellation of claims 22-40 is reiterated from the Response to Office Action dated August 26, 2002. Applicants have amended claim 1 to indicate that the polymeric side chain has one functional group per repeat and at physiological pH each functional group has a single positive charge. Support for the amendment can be found throughout the specification, e.g., at p. 5, lines 1-9. Support for new claims 41-49 is found throughout the application, e.g., at page 13, lines 18-30; page 10, lines 19-21; page 12, lines 12-13; and page 13, lines 16-17.

35 USC § 102

Claims 1-3, 10-11, 12, 13-14, 18-19, 20 have been rejected as allegedly anticipated by Onishi et al. (5,547,576). Applicants respectfully traverse the rejection. Applicants believe that, as amended, claim 1 is not anticipated by Onishi et al. Applicants have added two new independent claims that are similar to claim one prior to the present amendment. These claims are also discussed below.

Claim 1 has been amended to recite that the polymeric side chain has one functional group per repeat, and each functional group has a single positive charge at physiological pH. Onishi et al. does not disclose the use of functional groups that would be predicted to have a single positive charge at physiological pH. Thus, Onishi et al. cannot anticipate pending claim 1. Since claims 2, 3, 10-14, and 18-20 depend from claim 1, they are also not anticipated by Onishi et al.

New independent claim 43 is similar to claim 1 prior to the current amendment except that it recites the feature that at least 97% of the polymeric repeats are covalently linked to a positively charged functional group. Nothing in Onishi et al. discloses such a high rate of linkage of positively charged functional groups to the polymeric repeats.

New independent claim 49 is similar to claim 1 prior to the current amendment, except that claim 49 recites that the functional group does not have more than one amino and no more

than two amino and imino groups. Onishi et al. discusses the number of amino and imino groups at column 6, lines 29-33, stating

If the sum [of amino groups and imino groups in the polyamine compound] is smaller than 3, the interaction with the substances to be adsorbed tends to become less due to the small amount of amine.

Thus, Onishi et al. appears to suggest that applicants' claimed invention that has functional groups of less than three amino and imino groups would not work. Therefore, Onishi et al. does not describe applicants' invention.

In view of the amendment to claim 1 and the arguments presented above, applicants request that the rejection under 35 U.S.C. § 102 (b) be withdrawn.

35 USC § 103

Claims 4-9, 15-17, and 21 have been rejected as allegedly unpatentable over Onishi et al. Applicants respectfully traverse this rejection for the reasons presented above and for the following reasons.

The Office Action concedes that Onishi et al. does not disclose the limitations of the rejected claims, all of which depend from claim 1 (Office Action at pages 3-6). However, as the rejected claims are all dependent claims, they are thus not obvious for the same reasons that claim 1 is not obvious, i.e., claim 1 recites that the polymeric side chain has one functional group per repeat, and each functional group has a single positive charge at physiological pH, and Onishi et al. does not disclose this information. There is no suggestion in Onishi et al. to use such a configuration of the functional groups. Therefore, applicants submit that the dependent claims cannot be made obvious in view of Onishi et al.

For some of the rejected claims, Onishi et al. does not provide sufficient information to determine whether there are specific differences between the claimed invention and the methods of Onishi et al. For example, claims 4-5, 6-7, and 8-9 relate to side chain length, amount of side chain engrafted, and degree of grafting, respectively. Claim 15 is drawn to a method that

includes the feature of the sample being a plasma sample and after virus is removed from the sample, there is a less than five-fold increase in the plasma sample's clotting time. Claims 16 and 17 relate to the sample flow rate. Claim 21 is drawn to a method that includes the feature of the purified virus being concentrated more than 100-fold relative to the sample. The Office Action concedes that Onishi et al. does not provide any of these features (Office Action at pages 3-4). Since Onishi et al. does not provide specific information related to these features, it is not possible to determine whether there are specific differences between Onishi et al. and the claimed invention. At a minimum, it is clear that Onishi et al. does not literally provide these features and so the obviousness rejection of the Office Action relies on speculation by the Examiner as to what the information contained in Onishi et al. might mean in terms of the claimed invention combined with speculation as to what one in the art would find obvious. Applicants contend that there is no suggestion in the cited art to make the inventions covered by these dependent claims, nor can there be any motivation to modify what is not even disclosed in the art to make the present invention. Applicants therefore submit that the claims are not obvious in view of Onishi et al.

In addition, claims 4, 5, and 6 to 9 are patentable for at least the following additional reasons. The Office Action states that, with reference to claims 4 and 5, which specify the length of polymeric side chains, Onishi et al. does not disclose the length of side chains. Applicants contend that without guidance as to the length of side chains, which can include considerations related to steric hindrance, which depends on, e.g., the size and charge on the functional groups used, one in the art would not know to select side chains of the lengths in the claimed invention. In other words, the selection of the side chain length is more than routine optimization based on Onishi et al. Furthermore, Since Onishi et al. used their membranes for the same purposes as the claimed method, there is simply no motivation to alter any parameters recited in this patent.

Claims 6-9 recite features related to the amount of side chain engrafted per square meter and the degree of engraftment of side chains. The Office Action cites Onishi et al. as providing a charge on the membrane surface and states

it would have been obvious to one skilled in the art...to control the drafting [grafting?] (engrafting), to provide a cationic level of charge on the membrane surface, or adjust the number of side chains (ethylamine compound) reacted with the radicals produced by the acrylate on the membrane surface to produce a change capable of performing the virus removal function required (Office Action at page 4).

Applicants disagree with this analysis. The Office Action appears to suggest that the parameter of overall charge is interchangeable with the degree of engraftment or amount of side chain engrafted. However, the overall charge is determined by factors related to charge, while the degree of engraftment relates not only to charge, but also to other considerations such as the size of the functional groups. Applicants submit that information in Onishi et al. related to charge does not make obvious the specific parameters of claims 6-9.

In view of the amendment to claim 1 and the arguments presented above, applicants submit that the claims are not obvious and respectfully request that the rejection under 35 U.S.C. § 103 be withdrawn.

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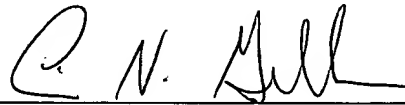
Attorney's Docket No.: 00786-429001 / MGH-1424.0

CONCLUSION

In view of the arguments and amendments presented herein, applicants believe that the claims are in condition for allowance, which action is respectfully requested. Enclosed is a \$55 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, referencing attorney docket number 00786-429001.

Respectfully submitted,

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